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ENTOMOLOGICAL NEWS

Tipula abdominalis.
(End of Larva.)

JUNE, 1902.

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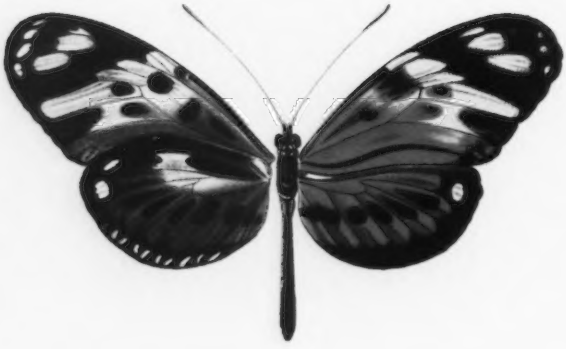

J. Henry Blake, artist. S. Wessel, lith. Boston.

HELICONIUS SPADICARIUS A.G. Weeks del.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIII. JUNE, 1902. No. 6.

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Our plate (VII) represents a species from Bolivia, described by Mr. Weeks in the Proceedings New England Zoological Club, Vol. 2, p. 72, 1901.

Three New Anthidiinae from Colorado.

BY E. S. G. TITUS, Urbana, Illinios.

Anthidium pondreum n. sp.

♂.—Form and general appearance of *atrifrons* Say; black with deep yellow markings; closely punctured; pubescence white, very dense on face and pleura, sparse on cheeks and basal segments of abdomen, tufted at sides of other segments; venter polished, but segments narrowly pubescent at sides; femora, tibiæ, and first joint of tarsi anteriorly, thorax above and occiput with sparse ochraceous pubescence; ferruginous pubescence on inside of tarsi; the clypeus (except two black dots at base), anterior orbits of eyes half way up, spot behind summit of eyes, mandibles except ferruginous tips, anterior half of tegulæ, line beneath, spot on each side of anterior portion of mesothorax, line and before it a dot on each side of scutellum,

spots on posterior femora, tibiæ and first joint of tarsi anteriorly, bands on dorsal abdominal segments 1–6, interrupted in middle on 1–5, notched anteriorly on each side are all yellow; last segment with two large yellow spots, first segment notched sublaterally behind, sixth segment with a spine on each side, last segment deeply notched with a blunt black tooth in the center. Length 11 mm.

Described from two males, June 16, on *Astralagus* sp., at Fort Collins, Colorado. Differs from *atrifrons* Say by the yellow markings, scape entirely black and different shape of last abdominal segment.

Protanthidium cockerelli n. sp.

♂.—Large, broad, robust; in general appearance resembles some *Anthophora;* clypeus, face on each side narrowly continued above the base of the clypeus, mandibles, except tips, *white:* a line behind upper part of eye, two spots on scutellum posteriorly, ends of four anterior tibiæ on the outside, outer edge of posterior tibiæ, line on inside of anterior femora, first joint of tarsi, segments 1–6 of abdomen, dorsally with continuous bands slightly notched anteriorly in center of five and six, band broad on sixth segment, last segment with a small spot at tip; all *dark yellow;* rather coarsely and deeply punctured; pubescence dull ochraceous, sparse; scutellum slightly produced behind and somewhat bilobed; last dorsal segment of abdomen truncate, excepting a short obtuse tooth in the middle; *labial palpi* with *second joint scarcely longer than first; maxillary palpi distinctly three-jointed;* venation as in *Anthidium s. str.* Length 16 mm.

Described from two males; Rocky Ford, August 10, 1897 (Gillette); and Virginia Dale, Colo., (alt. 8000 ft.), Sept. 3, 1899 (Titus), on *Rudbeckia hirta* L. The types are in the Colo. Agr. College Museum at Fort Collins, Colo.

This species is somewhat related to *occidentalis* as determined by Prof. Cockerell; differs in color of pubescence and markings, and in position of markings on abdomen, is also broader and larger generally. The peculiar bilobate scutellum distinguishes this from any species I have seen. Though *Prothanthidium* Ckll. has for its type a bee from India, *P. steloides*

(Bing.), the species above described seems to answer all the generic characters given by the authors of the genus.

I take pleasure in dedicating this species to Prof. T. D. A. Cockerell.

Dianthidium balli n. sp.

♀.—Black; with dark rich yellow markings, head and thorax densely uniformly punctured, abdomen with punctures of *apical margins* of segments dorsally smaller and denser than on *basal* margins; the clypeus, excepting an inverted T in the middle, anterior orbits of eyes narrowed at tip above and line leaning away from eye; wide line continuous over occiput and extending down about half way on each side; spot on posterior orbit about half way up from end of line to base of eye; line on each side of mesothorax, tegulæ anteriorly, spot below, four short lines at scutellum, apical ends of posterior and middle femora, tibiæ and first joint of tarsi anteriorly, *all dark yellow;* remainder of tarsi ferruginous; tip of tibiæ exteriorly with a ferruginous spot on the middle, anterior tarsi strongly ferruginous, a short blunt spine at apex of first segment; claws partly black; bands on segments 1–5 narrowly interrupted in the middle and that on first segment notched laterally behind, on last segment broadly interrupted in the middle, *yellow;* last segment deeply notched behind with a shallower notch on each side; pubescence on face, cheeks, occiput and thorax above, *ochraceous;* pleura densely, base and venter of abdomen and legs, except tarsi, with *white* pubescence; tarsi ferruginously haired; dorsal abdominal segments above with scattered white pubescence; wings smoky, tips less densely so; second recurrent nervure entering close behind end of second submarginal cell. Length 14 mm.

Described from one female specimen taken at Ridgeway, Colo., July 31, by Prof. E. D. Ball, after whom I have named it. This species is quite close to *venustum*, but differs in color, markings and their positions and is larger. The labial and maxillary palpi show this to belong to the genus *Dianthidium* Ckll.

NOTE—The above descriptions are extracted from an unpublished thesis of the author's deposited with Sec'y State Board of Agriculture of Colorado, May 1, 1901.

Description of an Apparently New Species of Palindia.

By W. J. HOLLAND.

Through the kindness of Mr. H. D. Merrick of New Brightton, Pa., I have been permitted to carefully examine a specimen of the genus *Palindia* captured by him last year flying among low herbage in the outskirts of the town of New Brighton. I have carefully examined the literature of the subject and am inclined to believe that we are dealing with a new species of the genus, although the specimen in certain respects comes very near to *Palindia mabis* Guénée, which is a synonym for *Palindia fumata* of Felder and Rogenhofer. There is no traffic between New Brighton and tropical America, so far as is known, unless it be in tropical fruits. There is a bare possibility that the insect may have been imported from the South, but the specimen presents the appearance of having freshly emerged and is in good condition. It is altogether improbable that so frail a creature should have, by the action of the wind, and by the powers of flight, been transported from the tropics to the locality where it was captured.

Palindia merricki sp. nov.—Front, palpi, collar, thorax and tegulæ dark wood brown; upper side of abdomen paler wood brown; lower side of thorax and abdomen ashen gray. Legs concolorous, the tarsi white, ringed with black. The primaries are brown, more or less irrorated with purplish scales, clouded near the middle with a dark purplish shade and laved on the outer margin with the same color. There is a dark basal line which extends from the costa to the median vein. The transverse anterior and median lines run obliquely from the costa to the inner margin, very nearly parallel to each other, the transverse anterior terminating about the middle of the inner margin, the median line terminating just before the inner angle. The median line is defined externally by a pale yellow line running from the lower margin of the cell toward the inner angle, and this line is in turn defined externally by a narrow dark brown line. At the end of the cell there is a large pale reniform spot surrounded by a dark brown line. The transverse posterior line is sharply angulated below the costa and then runs from the costa to the inner angle, constantly diminishing in width. Between this and the subterminal line are some reddish shades. The subterminal line is more or less obscure, angulated inwardly just below the costa and on vein 2. At the points where this line is bent inwardly, and half way between these points, are dark brown shades produced inwardly. The marginal line is

black, relieved by a series of bright yellow dots at the extremity of each of the veins. The fringes are dark wood brown. The posterior wing on the upper side is dark wood brown. The wing is sharply produced at the extremity of vein 3. About the middle of the wing below the cell a series of pale blue parallel lines, succeeded by an irregular median line, which does not run to the costa, but originates beyond the cell, curves first downwardly and then outwardly to vein 3. Between veins 3 and 2 it forms an angle with its point directed towards the base, and then sweeps, by a regular curve, inwardly to the inner margin. This line is defined outwardly and inwardly by fine pale yellow lines. In the angle between veins 2 and 3 is a dark black triangular spot defined externally by a white patch and irrorated with bluish scales. This patch is succeeded by two small black points connected by a fine silvery white bar which is a portion of the submarginal line, which is interrupted with a dark shade at the point where the wing is externally produced at the extremity of vein 3. The marginal line is very fine, silvery white. The fringes are of the same color as on the upper wing. Both wings on the under side are gray clouded outwardly with dark fuscous. In both the dark transverse posterior lines of the upper surface are reproduced faintly, most conspicuously on the lower side of the secondaries, where the line is crenulate. There are a few minute white spots at the exremity of the subcostal nervures on this side.

Expanse 34 mm.

Type in collection of H. D. Merrick, New Brighton, Pa.

The Three Californias.

By F. E. Blaisdell, M.D.

To Prof. H. C. Fall is due the credit of the awakening that has taken place among the Californian Entomologists. In his recent and excellent effort* he has shown how interesting and stimulating a preliminary list may be, and besides he has exposed the inaccuracy of much of the previous work that has been done within the State.

Knowledge to be useful must be accurate; it necessarily follows that observers and recorders of biological data must be painstaking, and endeavor to eliminate error in order to place such data upon the altar of scientific perfection.

Unfortunately we have to attain precision—it is not born

* List of the Coleoptera of Southern California, with notes on Habits and Distribution (occasional papers of the Cal. Acad. Nat. Sci.).

with us. Careful work bears a stamp that is unmistakable; carelessness sees the fruits of its labors relegated to the last page of a memoir, reserved for doubtful data and unrecognized species.

Earlier observers lacked the facilities and modes of research that now smooth and render comparatively easy, the work that was once achieved by overcoming apparently insurmountable obstacles, that met the pioneers in our favorite field of research.

Who will say that the pleasure they enjoyed in opening up new faunas did not repay them ten-fold for their privations?

In those days it was sufficient to label a specimen Calif. Times are changed. California was as large a State then as now, stretching north and south for the distance of 700 miles, and as Dr. Edw. C. Van Dyke has said: "It is a land of many climates and faunas."

It is cold and damp in the north; hot and dry in the south, with an intermediate or middle portion partaking of both of its extremes. Thus it is customary to speak of Northern, Southern and Central California. The question has recently been raised, where does the one begin and where does the other leave off?

The locality labelling of most any collection that contains Californian specimens will be mute evidence that this question has never been answered. There being no definite boundaries to the three divisions of California just mentioned, we do not know positively what part of the State is really meant when a specimen is labelled Central Calif.

How is this to be remedied? How are past errors to be corrected? Prof. Fall partially gave an answer when he said: "Briefly described, the term Southern California includes that part of the State lying to the south and east of a line drawn from Point Conception eastward along the Santa Inez Mountains, then curving to the north and east around the southern end of the San Joaquin Valley, and along the desert slopes of the Sierra Nevada Mountains through Kern and Inyo Counties to the Nevada State line."

The author realized that it was impossible to draw a true

interfaunal line, it is an effort at approximation. It fills a long-felt want, whether it was ever before realized or not—it gives definite boundaries to Southern California, and is a step towards more recent knowledge.

To a most worthy veteran in the field of entomology—Mr. Chas. Fuchs—belongs the honor of giving the impetus that completed the answer to the above question; that brought about a discussion of the distribution of insects at the second regular meeting of the Calif. Ent. Club, which resulted in the reading of able papers at its third regular meeting on February 22nd.

As a result it was unanimously agreed to accept the divisional line suggested by Mr. Ralph Hopping for defining the boundary line between Northern and Central California, namely:—The term Northern California includes that part of the State lying to the north of a line drawn from the Golden Gate, following the Bay of San Francisco to the mouth of the San Joaquin River, thence along the northern boundaries of San Joaquin, Calaveras and Alpine Counties, to the Nevada State line; that the term Central California includes the intermediate part of the State lying between Hopping's line on the north, and Fall's line on the south.

By this act the boundary lines of Northern, Central and Southern California are definitely fixed.

The State faunal areas are unaffected by this division, and acquire new relatives, which will be ably treated at a later date.

Mr. Fuchs recommended that the Secretary of the Club publish an article calling the attention of entomologists at large to the fixing of definite boundaries for the three Californias, and that collectors and writers upon Californian entomology be urged to conform their future observations and writings to these—the latest efforts at accuracy in the study of geographical distribution and intra-State faunas.

This act and article are approved by the following members present at the third regular meeting of the California Entomological Club, held on the evening of February 22, 1902. Chas. Fuchs (*President*), Edw. Ehrhorn, Beverly Letcher, J. C. Huguenin, James W. Cottle, F. E. Blaisdell (*Secretary*).

Four New Species of Butterflies From South America.

By LEVI W. MENGEL, Reading, Pa.

(See Plate VIII)

Anatole modesta sp. nov.—Upper surface of fore wings generally white and variable shades of brown. The costal edge is very light brown, terminating half-way to the apex; broadest at the base. A patch of the same color, edged with white toward the exterior margin, appears three-quarters the distance to the apex. A row of spots, a shade darker, extends along the exterior margin, almost to the inner angle. The exterior edge is tipped at several places with white. A silver gray coloration appears at the base of the wing and extends along the interior margin half-way to the angle. A row of small, well marked light brown spots, white in color, extends across the the wing just within the marginal light brown spots from the costa to the interior margin. All the white and light brown markings are surrounded with very dark brown, except at the interior margin, where the white marks reach the edge and spread toward the angle. The same colors prevail on the posterior wings, with the white predominating. From the base a dark brown band extends half-way to the apex. Towards the base and adjoining the dark band the same silvery gray color as in the fore wing appears, spreading toward the inner margin, but fading to white. The white extends two-thirds across the wing from the anterior margin to the inner margin. The remaining portion of the wing is dark brown, darkest at the angle and fading toward the anal angle to very light brown. White and light brown spots are scattered through the dark marginal bands. Wings emarginate, tipped here and there with white. Undersides in both sexes, tawny and white. The dark brown and lighter color being replaced with tawny. Abdomen and thorax very dark above; white underneath. Markings of the female very much like male. The brown and light colors being replaced by a gray-black, almost uniform. There are but very few pale brown spots. The white band is more decided in the female. Female is one-eighth inch larger than the male.

Expanse, one and three-eighths inch.

Habitat.—Sapucay, Paraguay.

Apodemia ochracea sp. nov.—General colors, black and ochreous yellow, marked with white spots. Uppersides, base of fore wings uniformly ochreous; the color extending one-third along the anterior margin to the apex and half-way to the inner angle, along the inner margin. A black patch somewhat quadrangular in shape almost surrounded by ochreous is observed on the anterior margin. A well marked white spot appears in the black patch. A broad band of the ochreous color reaches almost from the anterior margin to the color of the base with a single white spot close to the margin. The inner edge of this band forms the

FOUR NEW SPECIES OF BUTTERFLIES FROM SOUTH AMERICA (MENGEL).

ANATOLE MODESTA.
ANATOLE MODESTA.
APODEMIA OCHRACEA.
BÆOTIS BIFASCIATA.
NECYRIA GERHARDI.

boundary of the black patch above mentioned. Balance of wing black marked along the outer margin by a band of ochreous spots. A row of white well defined spots extends from the outer portion of the anterior margin almost to the inner margin. This band begins three-quarters the distance from the base towards the apex. Inferior wings, black, marked by a well defined ochreous band beginning almost at the anterior margin and extending in a curve to the inner margin. There is a marginal band of ochreous color extending along the lower half of the exterior margin to the apex. Undersides very much lighter. The ochreous of the uppersides replaced by much lighter color, almost light yellow. The row of white spots of upper sides larger and better defined as is also the marginal band. Two black spots are seen in the yellow near the base. Posterior wings marked by a band of very pale yellow, extending across the middle of the wing from the anterior margin curving to the inner margin. Base black, variously marked with white spots. A row of white spots is seen in the black, reaching from the apex to the inner margin just above the margin. There is a marginal band of yellow spots along the outer margin. The yellow band in the posterior wings is broken by the nervules, which are black. Thorax and abdomen black. Abdomen marked by a yellow stripe along the sides. Collar yellow.

Expanse, one and three-eighths inch.

Habitat—Sapucay, Paraguay.

Bæotis bifasciata sp. nov.—Color above uniformly black with buff bars and spots, well marked. Extending from the interior margin, one-third to the inner angle from the base, a diagonal narrow bar of buff extends to the costa, not quite reaching the margin. Three-quarters the distance from the base to the apex, a narrow bar passes from the costa toward the inner angle, stopping half way across the wing. Two-thirds the distance from the base to the angle a small narrow bar extends from the inner margin towards the apex, one-fourth the distance to the apex. A small well defined spot appears at the inner angle; also one in the middle of the exterior margin. Lower wings. One-third the distance from the base to the apex, a bar extends from the anterior margin to the inner margin. Two-thirds the distance from the base to the apex, another bar passes parallel to the first from the anterior to the inner margin. Anal angle marked with a well defined spot. Another spot appears in the middle of the exterior margin. Female like male, buff markings stronger. Undersides same as above. Body uniformly dark approaching black.

Expanse 1 inch.

Habitat.—Sapucay, Paraguay.

Necyria gerhardi, sp. nov.—Superiors black, with a bar of metallic green, extending from the costa to the inner angle. Bar begins half way from the base to the apex. Inferiors black with a bar of the same metallic green extending from the apex almost to the inner angle. A large

bright red spot appears at the inner angle. The bars on both the superior and inferior wings are interrupted by the nervules, which are black. The undersides of the superiors uniform dark iridescent blue, covering the entire wing, except the apex and the exterior margin, which is black. Inferiors iridescent purple almost to the margins. A row of arrow shaped metallic green spots extends from the apex to almost the inner angle. The red spot seen on the upper side is larger and much more intensified. Thorax and abdomen black above, abdomen red beneath.

Expanse, one and five-eighths inch.

This species is nearest to *N. diva Stgr.*, but differs from it entirely.

Habitat.—Chauchamayo, Peru. Named in honor of Wm. J. Gerhard, Chicago, Ill.

Notes on the Acroceridae.*

By A. Leonard Melander.

Because of their brilliant color, anomalous structure and rare occurrence, the flies of the family Acroceridæ have generally been considered the *raræ aves* of the insect world. As but few collections in this country contain over a half dozen species, and scarcely any more individuals, the advent of a new form is heralded with interest. The following notes are made from specimens in the collections of Dr. Wheeler and myself.

1. **Oncodes costatus** Loew.

This seems to be the only representative of the family that occurs at all commonly in the northern States. It is readily recognized by the broad pale yellow bands extending across the fuscous abdomen. Specimens from Wisconsin and Ontario are in the collection.

2. **Oncodes** sp. indeterm.

An apparently undescribed species of *Oncodes* occurs in Pennsylvania. This form, which was taken by Mr. H. G. Klages, differs from the preceding in the wholly yellow color of the body.

3. **Oncodes eugonatus** Loew.

A specimen from Austin, Texas, taken in grass-sweepings,

* Contrib. from the Zool. Lab., Univ. of Texas, No. 31.

differs from the specimen Dr. Loew received from Mr. Belfrage, and taken some hundred miles north of here. The differences, however, do not seem to be of specific importance. In the Austin form the white bands of the abdomen are narrow, but clear cut, of uniform width, and only one-tenth as wide as the remaining shining black of the segments. The venter is similarly colored, although from the convexity of the abdomen, the white bands seem comparatively wider; the first ventral segment is black, with the narrow apical margin whitish. The knees, tibiæ and base of the tarsi are almost wholly pale fuscous, the darker coloration of the upper side of the tibiæ apparently less evident than in Mr. Belfrage's specimen. Instead of possessing a black margin the tegulæ are wholly translucent whitish. The base of the wings is lightly infumated.

4. **Acrocera** sp.

A very beautiful and brightly marked, but undetermined species was taken by Mr. F. Rauterberg at Rochester, Wisconsin. Although it agrees in part with *A. liturata* Williston from Washington, I prefer to pass this species by, as I have access to but a portion of the literature on this genus.

PTERODONTIA Gray.

Scutellum wholly testaceous . . . . . **flavipes** Gray.
Scutellum wholly or largely black . . . . . 2.
2. Discal cell closed; larger species (5 mm.) . . . . . **misella** O. S.
Discal cell open; species measuring 4 mm. . . . . **analis** Westw.

5. **Pterodontia analis** Westwood.

Several specimens of this species were taken on leaves of low trees in the damp woods about Wood's Hole, Massachusetts. The determination is doubtless correct, although the northern specimens disagree with the description in that they have wholly black eyes, almost blue-black, tegulæ with the disc but little translucent, and black femora. *Pt. flavipes* is said to be commoner in the Eastern States, but we have never met with it.

6. **Pterodontia misella** Osten Sacken.

A typical specimen from Alameda Co., California.

OPSEBIUS Costa.

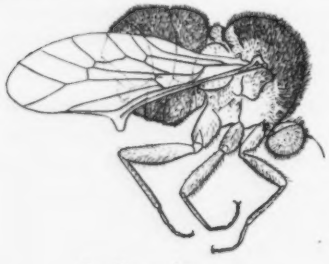
Wings with a prominent tooth; anal cell widely open . **agelenæ** sp. nov.
Costa nowheres projecting . . . . . 2.
2. Wings with a blackish tinge . . . . . 3.
Wings with a testaceous tinge . . . . . 4.
3. Anal cell open; third posterior cell longer than the fourth.
sulphuripes Loew.
Anal cell closed; third posterior cell shorter than fourth.
gagatinus Loew.
4. Wings pale at base and tip . . . . . **diligens** O. S.
Wings unicolorous . . . . . **paucus** O. S.

7. **Opsebius sulphuripes** Loew.

One specimen, Alameda Co., Calif.

Although from a State so distant from the locality type (New York), this specimen shows no important differences. The antennæ are piceous, however, the hind margin of the wing is scarcely paler, and the anterior (smaller) cross-vein is oblique; but aside from these, the form seems to be identical with Loew's species.

8. **Opsebius agelenæ** sp. nov.—♂. Length 6 mm. Of a shining semi-metallic, bronzed, blackish brown ground color, densely clothed with long fulvous pubescence, excepting (in the Texan form) the eyes, which are clothed with black hairs. Antennæ short, consisting of two minute oval fuscous joints, the outer smaller, the terminal slender, fuscous arista three times as long as the antenna. The hairs of the abdomen become a little sparser apically, but are still uniformly fulvous. Tegulæ translucent hyaline, the narrow margin testaceous. Halteres testaceous. Coxæ concolorous with the body, legs uniformly testaceous, the tips of the claws black. Wings clear hyaline; the marginal and first submarginal cells tinged with yellowish, veins pale yellow; the costa strongly thickened, angulate at the middle of the marginal cell and there bearing a large blunt projection; two submarginal cells and four posterior cells, the first posterior cell divided in two beyond the discal cell, but the position of the cross-vein inconstant; anal cell of even breath toward the tip, broadly open.



Opsebius agelenæ n. sp.

Described from two male specimens from Austin, Texas, and one male from Rochester, Wisconsin.

One of the Texas specimens was found under a stone, entangled in the web of the southwestern variety of *Agelena nævia* Bosc., apparently just after issuing from the body of the spider. The shrivelled spider was lying close by, with a round perforation near the base of the under side of the abdomen.

Were it not for the great variability in the neuration of the members of this family, this species might be thought out of place in *Opsebius*. As it, however, presents the characteristic habitus, the discrepancies in the costal tooth and widely open anal cell are insufficient to exclude it from the genus. Moreover, we may recall that in *sulphuripes* the anal cell is narrowly open, showing a trend in the directlon of *agelenæ*, while in *Pterodontia* the costal projection is quite variable in size, and even in *Opsebius diligens* the costa shows a thickening beyond the first vein.

9. **Eulonchus smaragdinus** Gerstaecker.

Two green females, measuring 8 and 10 mm., were taken in Marion Co., Calif.

10. **Eulonchus sapphirinus** Osten Sacken.

One male from Marion Co., Calif.

11. **Eulonchus tristis** Loew.

As this species seems to be relatively common in Idaho, according to Prof. Aldrich, *Eulonchus* can no longer be regarded as exclusively a Californian genus. The males have the third joint of the antennæ sharp at the apex; in the female it is scarcely attenuate and rather blunt. One female from Marion Co., California, has the abdomen brassy green; a pair from Idaho (Juliaetta and Craig's Mt.) are blue-black. There is a great inconstancy in the juncture of the veins beyond the tip of the discal cell. In the California specimen the vein separating off the second submarginal cell is angulated near its base, and bears a short spur at the angulation; while in the Idaho specimens this vein is evenly bisinuate, although it bears a similarly-placed short spur. The males have the second submarginal cell petiolate at the base; in the female it is pointed

but nearly sessile, the very short petiole thickened; while outwardly the bounding veins of this cell diverge rather prominently, not being parallel as in the male.

12. **Ocnæa helluo** Osten Sacken.

A specimen of this large species was taken entangled in a small spider-web at Marble Falls, Texas. As it presents the same differences in neuration as does the specimen mentioned by Dr. S. W. Williston (Trans. Am. Ent. Soc., XIII, p. 294), in that the outer first posterior cell is but slightly narrowed towards the margin, we are led to believe that Osten Sacken's specimen was a sport. The blue-black body, black coxæ, and shortened abdominal fasciæ are but a slight variation from the type which I have examined, and which otherwise is quite similar.

As nearly all the foregoing insects differ from the types, we are brought to realize the instability of characters in this family, and to notice that individual variation is strikingly prominent.

THE GENUS *Lithurgopsis*.—I would add two remarks to the interesting paper by Mr. Fox in your May number: (1) *L. echinocacti* is best distinguished in the ♀ from *apicalis* by the face being more narrowed below and the distance between the prongs of the facial prominence less. (2) I will accept Mr. Fox's identification of *L. gibbosus*, although Smith's description appears to agree equally well with my insect. The form I called *gibbosus*, with the dark hair on end of abdomen, may stand as *L. apicalis* var. *opuntiæ*, since it is a fairly distinct geographical race.

I may also note that Mr. E. E. Green has discovered that *Pseudolecanium* is a synonyn of *Aclerda*, so Mr. Kuwana's species (p. 134) becomes *Aclerda distichium*.—T. D. A. COCKERELL.

NOTE ON LITHURGOPSIS.—Since my article on *Lithurgopsis* appeared in the May issue of ENT. NEWS, Mr. T. D. A. Cockerell has written to me saying that the labial palpi of that genus are 4-jointed, and not 3-jointed as stated by me. I have examined these palpi again and concur with Mr. Cockerell's statement. The third joint is easily missed, appearing in line with the second, but if the specimen is carefully examined the two joints are seen to be well differentiated.—WILLIAM J. FOX.

A New Papilio.

By Henry Skinner.

P. polyxenes Fabr. var. **curvifascia** n. var.—Primaries of the male on the upper and under surfaces practically identical with *polyxenes*, except that the spots are larger and have more of an orange tinge. Secondaries above as in *polyxenes*, except that the orange spots of the mesial band are practically all of the same size and shape. The first three are nearly round and the next three slightly ovoid; the last one, preceding a mere line, is quadrate. There is an entire absence of any spot in the discal cell. The band of spots crossing the centre of the wing forms a distinct curve, with the concavity inward, while in *polyxenes* the band makes a straight line, and the inner edge of the spots makes a straight line. This band is the same on the underside of the wing, except that the spots are washed with a brick-red color.

The female is exactly like the male in markings, except that the spots on the primaries are lighter in color. The tails to the hind wings are shorter than in *polyxenes*, and the tails of seven specimens measure in length 5.5, 6, 6.6, 7, 9 mm. respectively.*

Described from six males and one female from Rincon, New Mexico, taken June 1, 1898, and kindly submitted for examination by Mr. Geo. Franck, of Brooklyn, N. Y. Mr. Franck said some of them suggested *Papilio indra*, but others had longer tails. They are very close to *brevicauda* found in Anticosti and Newfoundland, and show the same likeness of the sexes. It may be of interest to state that Godman and Salvin in the Biologia Centrali-Americana put *asteroides* Reakirt as a synonym of *polyxenes* Fabr. and properly so. The type (so marked) is in the collection of the American Entomological Society, and agrees perfectly with Reakirt's description. Strecker's figure does not represent this insect. The type specimen of *asteroides* in simply an inconstant and accidental variation, and a collector could take a dozen equally as aberrant wherever the species is common.

I have seen lately in the collection of Mr. George Franck, the following species of Hesperidæ caught within the limits of the United States and heretofore unrecorded.

Thespieus macareus Herr.—Schäff. From Marco Island, Florida.
Prenes Nero Fabr. Marco Island, Florida.
Prenes ares Feld. Cochise Co., Arizona.
Epargyreus exadeus Cramer. San Luis Obispo, California.

Henry Skinner.

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* Measured from tip of tail to end of nearest marginal lunule.

Two New Texan Ant and Termite Guests.*

By Charles Thomas Brues.

(See Plate IX.)

Scarcely any method of entomological collecting yields a more varied and remarkable harvest of insects than the examination of ants' nests and their contents. As this is especially true of the warmer regions of our country, Texas is not without its full share of strange Myrmecophiles and Termitophiles.

The two remarkable species herein described, which were collected in the vicinity of Austin, Texas, add two genera to our fauna and serve well to indicate what a wealth of interesting forms we may expect to unearth in the future in similar locations.

STAPHYLINIDÆ.

ECITOXENIA Wasmann.

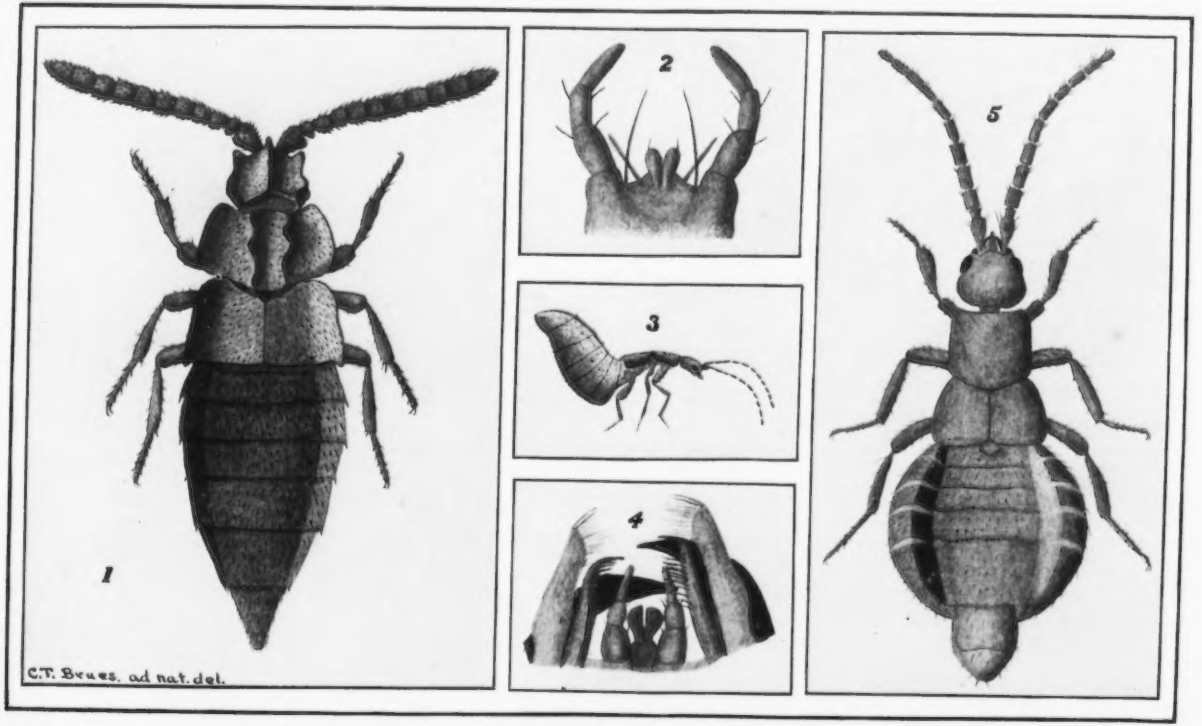
A beetle referable to this genus was collected in considerable numbers by Mr. A. L. Melander and the present writer in a nest of *Eciton schmitti* Em. On one of our entomological excursions, one afternoon during the past winter (January, 1902), we chanced upon a large colony of the *Eciton* clustered beneath a flat stone. On examining the nest more closely, we succeeded in discovering at least four different species of Myrmecophiles which we had previously seen,† besides one which was unfamiliar to us. The latter was quite agile in its movements, although, unlike most Ecitophiles, it possesses extremely short legs. Its flat body seemed almost to glide along on the surface of the stone, as it picked its way among the excited groups of ants.

In its general habitus this beetle greatly resembles the Brazilian *Ecitoxenia mirabilis*, described by Wasmann.‡ It is seen to differ considerably in detail however, and I should feel

* Contributions from the Zoological Laboratory of the University of Texas. No. 32.

† These were *Ecitonidia wheeleri* Wasm., *E. tenella* Wasm., two Staphylinid beetles; *Anillus affabilis* Brues, a blind Carabid beetle; and *Xanionotum hystrix* Brues, a wingless Phorid fly.

‡ Neue Dorylinengæste aus dem neotropischen und dem æthiopischen Faunengebiet, Zool. Jahrb. Abth. f. Syst., Bd. 4, Heft 3, 1900.



TWO NEW TEXAN ANT AND TERMITE GUESTS (BRUES).

constrained to consider it as the type of another genus, were it not for the already large number of monotypical genera of Myrmecophiles and Termitophiles already described. As such is the case, I think we must broaden our conception of genera in these groups where remarkable forms are of common occurrence. I can see no reason why this should not be done, for who would for a moment assert that the distinction between two genera of primitive insects like Orthoptera should be made as fine and delicate as between two genera of specialized Muscidæ, where the parts of the body have become so absolutely fixed? This tendency to produce strange forms in Myrmecophiles is so evident that it ought not to be ignored in our classification of them.

Following is the description of the new species:

Ecitoxenia brevipes sp. nov. (figs. 1 and 2).—Body broad, elongate-oval. Head and thorax carinated, as well as lateral margin of elytra. Abdomen very widely margined. Antennæ 11-jointed, reaching to the apices of the elytra, very stout, gradually and weakly clavate from the base of the second joint. First joint stout, as long as the two following, enlarged at apex, second small, triangular, third larger and less triangular, fourth to tenth quadrate, but little longer than wide, eleventh obtusely conical, one and one-third as long as the tenth. Head about as wide as long, rather acutely prolonged between the antennæ, this prolongation continuing back as a high carina, which extends to the middle of the head. Anterior angles also produced and elevated, forming an oval depression on each side of the median carina. Posterior angles raised and produced; two other oblique carinæ on posterior portion of head, forming with the median one a **A**. Eyes moderately finely granulated, not visible from above, being sunk in broad lateral depressions at about their own diameter behind the insertion of the antennæ. Mandibles simple, acute at apex. Labium wide, rounded truncate. Outer arm of maxilla about one-fourth longer than the inner; both densely ciliated, the outer one only for a short distance. Maxillary palpi 4-jointed, second and third joints about equal, the third broader, fourth very slender and obtusely pointed, half as long as the third. Ligula broad, bilobed at base, lobes broad and rounded at apex. Paraglossæ long, slender. Labial palpi 3-jointed, second joint twice as wide as long, slightly shorter than the first or third. Prothorax oval, nearly twice as wide as the head, transverse, with three hollow depressions separated by two high sinuous longitudinal carinæ. Lateral margin also carinated. Thorax sparsely hairy, as are also the head and elytra. Elytra about as long as the thorax, their lateral margins broadly turned up, truncate at apex, except for an emargination near the posterior angles, which are bluntly toothed. Abdomen com-

posed of seven segments, somewhat concave above and widely margined along the sides. Each segment somewhat dentate and bearing a short spine at the posterior angles. More or less clothed with short stiff hairs which become more delicate apically. Legs very short, tarsi 5-jointed, joints about equal on the four anterior feet, posterior pair with first joint the longest.

Length 3 mm.—Head, thorax, two or three apical segments of abdomen, elytra, legs and venter reddish fuscous. Abdomen piceous. Antennæ fuscous. Body opaque, except the abdomen, which is shining and sparsely punctured. The hairs on the head, thorax and abdomen sparse, brassy on head and thorax, yellowish on abdomen.

Described from numerous individuals collected at Austin, Texas, in a nest of *Eciton schmitti* Emery.

The hairs upon the head and thorax are similar to the complex hairs seen on *Ulkeus intricatus* Horn, another *Eciton* Myrmecophile. In this case each hair is composed of about four slender barbs, which are separate to the base, where they unite.

TERMITOGASTER Casey.

Up to the present time there seem to have been no truly Physogastric Termitophilous Staphylinids discovered in North America. Such species have been found in other parts of the world, and since the first discovery of *Corotoca* and *Spirachtha* by Schioedte in 1854 their number has increased considerably, until at the present time some fourteen or fifteen genera are recognized from various parts of the world. All of them seem to occur only in the nests of various species of termites. In 1889 Casey described *Termitogaster insolens** from Panama, but all the remaining genera are represented by forms from Madagascar, Africa and South America. The new form therefore adds considerably to the range of such genera, and it is interesting to note in this connection that the species of Termite, with which it lives (*Eutermes cinereus* Buckley), is a truly tropical form occurring at Cuernavaca, Mexico, from which locality I have also seen specimens.

Eutermes is rather rare at Austin, as we have seen only three or four nests of it during the several years which we have spent in this region. In two of these nests specimens of the new Termitophile were found. It resembles the queen of

* Annals of the N. Y. Acad. of Sci., vol. iv, p. 384.

the termite somewhat in color and shape, although it is very much smaller and can hardly be considered mimetic of it. It is quite conspicuous when seen running about in the galleries constructed by the *Eutermes*, which always nest in the ground under stones. It presents a very grotesque appearance, often carrying its abdomen flexed so far dorsally as to be directed straight forwards over the thorax much in the same way as has been figured by Schioedte for *Corotoca*.

Termitogaster texana sp. nov. (Figs. 3, 4 and 5).—Female. Length (with the abdomen held horizontally) 2 mm. Head rounded, much widened behind the eyes, broadly rounded behind. Eyes moderately large, but slightly convex, coarsely facetted, oval, more or less pointed posteriorly. Antennæ situated in cavities just above and in front of the eyes, somewhat attenuated towards the apex, 11-jointed, not geniculate, first joint very slightly longer than the second and third taken together, second short, hardly more than half as long and considerably narrower than the third, third slightly wider than the first, following joints narrower and very slightly shorter. Front very short. Labrum transverse, rounded anteriorly. Ligula considerably produced, extending to beyond the tips of the mandibles, thick and membranous as in *T. insolens* Cas. Palpi 3-jointed, more slender than in the male, and with the second joint only half as long as the basal one. Maxillary palpi 4-jointed, first joint very short, second and third equal, the third stouter, fourth one-half as long as the third and very slender. Mandibles rather slender and arcuate at tips. Prothorax considerably wider than the head, slightly wider than long, its angles rounded. Scutellum indistinguishable. Elytra not connate, about as long as the prothorax, with a few short bristles on the lateral margin. Wings well developed. Abdomen capable of being bent up over the elytra and prothorax, greatly swollen, almost circular when seen from above; the dorsal segments not separated. Abdomen widely margined on the sides, this margin being raised rather sharply and then widely swollen out on the sides so that the swollen part is as wide as the margin when seen from above. The sclerites covering the margins and lateral surfaces of the segments are separated by white membrane. Abdomen everywhere sparsely short, bristly. First four dorsal segments gradually increasing in length, the fifth and sixth much longer. Sixth segment much narrower than the basal portion of the abdomen, appearing almost as an appendage to the circular part. Venter strongly convex and sparely setose, dorsum flat, except for the raised lateral margins. Legs moderately long, the anterior coxæ as long as the femora, and widely separated at their bases; middle coxæ shorter and but slightly separated, posterior ones transverse, slightly separated. Femora and tibiæ moderately stout, tibial spurs extremely small. Tarsi with the first joint longest, fourth minute on the fore and hind feet. Claws edentate. Entire

body testaceous, except the elytra, which are more or less blackened apically; abdomen, and especially the venter, still paler, except for a fuscous spot at the base of the first segment on each side below.

Male.—Length 1.45 mm.—Differs from the female in having the antennæ more slender and with the second joint nearly as long as the third, and the eleventh nearly one-third longer than the tenth. Mandibles stouter, the left one with a small median tooth. Ligula much shorter and bilobed (see fig.) Maxillæ with the inner lobe spinose and hooked at tip, the outer lobe longer and very finely ciliate at the apex. Prothorax as wide as the elytra and bearing three lateral and six anterior strong marginal bristles. Elytra also strongly trisetose laterally. Abdomen only slightly swollen and widened, scarcely one and one-half times as wide as the prothorax. Broadly margined above on the sides and very strongly but sparsely setose, composed of seven segments. The abdomen has a tendency to be elevated as in the female, although not nearly to so great an extent. Elytra fuscous on apical half, and first ventral segment not maculate.

Described from one female and two male specimens collected in the nests of *Eutermes cinereus* Buckley, at Austin, Texas.

As may be gleaned from the description, this form is quite different from the Panama *Termitogaster insolens* Casey, but I have refrained from establishing another genus for its reception. The two sexes are seen to differ, especially in the structure of the mouth-parts and form of the abdomen; but as they are the only Termitophilous Staphylinidæ common in the nests of *Eutermes* at Austin, I think they must undoubtedly be the sexes of a single species. The mouth parts of the female are probably modified to conform with the method the Termites have of feeding one another upon regurgitated food, a share of which the *Termitogaster* doubtless begs from its hosts.

The Genus Phyllonotus.

I have received a communication from Prof. Theo. D. A. Cockerell in which he calls my attention to the fact that the name *Phyllonotus* is preoccupied. Swainson (according to Scudder's Nomenclator Zoologicus, p. 246) gave the name to a genus of mollusca, consequently my use of the term as applied to a genus of Tettigidæ, in my recent monograph "The Tettigidæ of North America," p. 45, necessitates a substitution. The name *Phyllotettix* is here proposed in the place of *Phyllonotus*.—J. L. HANCOCK.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JUNE, 1902.

The "Canadian Entomologist" has been indulging in some interesting discussion apropos of "Ecological labels." Much of this is ancient history, as one of our most esteemed dead and departed entomolgists used color labels long ago and some of us are still trying to translate them. It is said that an assistant who was color-blind put many of these labels on the pins. We hold that an insect pin should have on it the exact locality and date of capture. If individual opinion demands more than this we can offer no objection, but words fail to express our opinion of the individual who has nothing on the pin. (*People who sends insects here please take notice.*) We object to all systems which string a multitude of labels on the pin, especially if a key is needed to translate them. We object to big bill posters on the pin to be read without a key or to have certain parts underscored. We do not deny that it may be important to know more about an insect than where and when it was captured, and advocate in such cases that *printed* pin numbers be used corresponding with printed numbers in a record book. Then it is possible to write anything desired about a species. The caution in this case is that it should be seen to *that the book is part and parcel of the collection*.—H. S.

Entomological Literature.*

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia pertaining to the Entomology of the Americas (North and South). Articles irrelevant to American entomology, unless monographs, will not be noted. Contributions to the anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in heavy-faced type refer to the journals, as numbered in the following list, in which the papers are published; * denotes that the paper in question contains descriptions of new North American forms. The titles of all papers will be quoted in the original and not translated.

1. Proceedings of the Academy of Natural Sciences of Philadelphia, liii, pt. 3, 1902.—**35.** Annales, Société Entomologique de Belgique, xlvi, Brussels, 1902.—**68.** Science, xv, New York, 1902.

THE GENERAL SUBJECT.—**Anglas, J.** Nouvelles observations sur les métamorphoses internes, 1 pl., Archives d' Anatomie Microscopique, v, 1, Paris, April 20, 1902.—**Davis, C. A.** See Coleoptera.

ECONOMIC ENTOMOLOGY—**Beebe, C. W.** Preliminary observations on a sub-dermal mite, **68,** p. 754. **Clarke, W. T.** The Californian vine hopper (*Typhlocyba comes* Say), Report, Agricultural Exper. Station, University of Colorado, 1897-98, p. 179, 1900.—**Thiele, R.** Der Kampf gegen die Blutlaus, Gartenflora, Berlin, May 1, 1902.—**Woodworth, C. W.** Sprays and washes, Rep't. Agr. Exper. Stat. Univ. Colo., 1897-98, p. 181, 1900.

ARACHNIDA.—**Banks, N.** Some Arachnida from New Mexico.* **1,** p. 568.—**Beebe, C. W.** See Economic Entomology.—**Brucker, E. A.** Monographie de *Pediculoides ventricosus* Newport et Theorie des pièces buccales des Acariens, 4 pls. Bulletin Scientifique de la France et de la Belgique, xxxv, Paris, 1901.—**Michael, A. D.** Nomenclature of genera, etc, in the Oribatidæ, Annals and Magazine of Natural History, ix, p. 309, London, 1902.

ORTHOPTERA.—**Hancock, J. L.** The Tettigidæ of North America.* Chicago, 1902.—**Scudder, S. H.,** and **Cockerell, T. D. A.** A first list of the Orthoptera of New Mexico, Proceedings, Davenport Academy of Sciences, ix, p. 1, 1902.

ODONATA.—**Calvert, P. P.** On the systematic position of *Thaumatoneura inopinata* McLach., with some remarks on the classification of the suborder Zygoptera, Entomologist's Monthly Magazine, London, Feb., 1902.

HEMIPTERA.—**Cockerell, T. D. A.** The monophlebine Coccidæ. **68,** p. 717, 1902; **Id.** *Aspidiotus ancylus* Putnam, Proc. Davenport Acad. Sci., ix, 1902.

COLEOPTERA.—**Davis, C. A.** Instructions for collecting and mounting insects. A check list of the Coleoptera of the State of Rhode Island, 2d edition, Pilgrim Press, Providence, R. I.—**Deegener, P.** Bemerkungen

* Owing to the absence of Messrs. Viereck and Rehn and—the fortunately now past—illness of Mr. Bradley, the larger part of the list of entomological publications received must be deferred until the next issue of the NEWS.

über dem Bau der Regenerationskrypten des Mitteldarms von *Hydrophilus*, Zoologischer Anzeiger, Leipzig, April 7, 1902.—**Lameere, A.** Revision des Prionides, Ier memoir, Parandrines,* **35,** pp. 59-111.—**Lea, A. M.** List of Australian and Tasmanian Mordellidæ, etc. Transactions, Entomological Society of London, 1902, pt. 1, p. 1.—**Pic, M.** Addenda aux Xyletini du Brésil, **35,** pp. 130-1; **Id.** Essai dichotomique sur le genre *Gibboxyletinus* Pic, **35,** pp. 132-3.

DIPTERA.—Grimshaw, P. H. Fauna Hawaiiensis, iii, pt. 1. Diptera. Cambridge (England).—**Theobald, F. V.** A monograph of the Culicidæ or Mosquitoes, London, 1901. Published under authority of the Trustees of the British Museum. Two volumes text, one volume plates.—**Wesché, W.** Modifications of the legs in some dipterous flies, Journal, Quekett Microscopical Club, April, 1902, p. 245.

LEPIDOPTERA.—Busck, A. A review of the American moths of the genus *Depressaria* Haw., with descriptions of new species,* Proceedings, U. S. Nat. Museum, xxiv, pp. 731-749.—**Hampson, G. F.** Catalogue of the Lepidoptera Phalænæ, vol. iii, London, 1901. Published under the authority of the Trustees of the British Museum.—**von Linden, M.** Le dessin des ailes des Lépidoptères (fin), Annales des Sciences Naturelles, Zoologie, xiv, Nos. 4-6, Paris.—**Pagenstecher, A.** Callidulidæ, 19 figs. Das Thierreich, 17 Lieferung, Berlin, March, 1902.

HYMENOPTERA.—Bethe, A. Die Heimkehrfähigkeit der Ameisen und Bienen, zum Teil nach neuen Versuchen. Eine Erwiederung auf die Angriffe von v. Büttel-Reupen und von Forel, Biologisches Centralblatt, Leipzig, April 1 and 15, 1902.—**Cockerell, T. D. A.** A gall-making Cynipid fly in Jamaica, Nature, London, April 17, 1902.—**Dominique, J.** Description d'un *Harpactes* nouveau, 1 pl., Bulletin de la Société des Sciences Naturelles de l'Ouest de la France (2) i, 3-4, Nantes, Dec. 31, 1901.—**Field, A. M.** Further study of an ant, **1,** p. 521.—**Plateau, F.** Observations sur les erreurs commises par les Hymenoptères visitant les fleurs, **35,** pp. 113-129.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

We understand that the Entomological Societies of Philadelphia, New York, Brooklyn and Newark, will hold a field meeting at Jamesburg, New Jersey, on July the 4th, and that all entomologists are cordially invited to be present.

The Psychophora mix-up.—I.—Dr. Skinner approvingly quotes Dr. Smith's opinion that *Psychophora fasciata* Skinner (Ent. News, xiii, 141) is a Bombycid. If this means anything, it means that the species belongs to the family Bombycidæ. As I do not suppose that either of the gentlemen hold this opinion, the deduction is obvious that the opinion quoted means nothing.

I also am quoted as referring the insect to the Noctuidæ. I did so because the first specimen that Dr. Skinner sent me had vein 5 of the fore wings nearer to 4 than to 6; in the hind wings, vein 8 remote from 7, anastomosing with the cell shortly near the base. A second specimen, however, had vein 5 from the middle of the discocellulars, and is, therefore, a Geometrid, considering the other characters, tongue present, antennæ not clubbed nor dilated, hind wings with vein 1c absent. The position of vein 5 of the fore wings is not usually variable, but here it certainly is. A knowledge of the larva would be useful. I think that the best place for the species, at present, is in the Geometridæ. Later I expect to remark further on the subject and shall refer to Dr. Skinner's identification of the genus *Psychophora*, with which I am now inclined to agree.—HARRISON G. DYAR.

I AM not sufficiently interested in the Heterocera to try and establish the position of *Psychophora* in the classification of the moths, and now leave it to others. Dr. Dyar is correct in saying that this genus does not belong to the family Bombycidæ as at present restricted, but does it belong to the Geometridæ or Noctuidæ? Would it not be logical to infer that the first specimen Dr. Dyar examined belonged to the Noctuidæ; the second specimen to the Geometridæ, and a possible third to something else? If he is satisfied with his examination of the neuration, why does he say "A knowledge of the larvæ would be useful"? I have relaunched the genus and added a new species and now wish them a pleasant voyage to the land of species and synonyms.—HENRY SKINNER.

VARIATION IN HETÆRINA TITIA DRURY (ODONATA).—In my work on the Odonata in the Biologia Centrali-Americana, I have grouped the species of *Hetærina* according to the number of rows of cells on the hind wings lying between the lower sector of the triangle and the hind margin. In this scheme *H. titia* is placed among those species having "two rows of cells (not more) in a considerable part of the area mentioned." Since the publication of this work, Mr. Banks has sent me a male and a female of *titia* from Laredo, Texas, both of which have *three* rows of cells in this area for a length of seven cells (or five cells in the left wing of the male). This has caused me to re-examine the material enumerated in the Biol. C.-Am. consisting of 54 ♂, 31 ♀, to determine the exact proportion of individuals in which three rows exist. As the result I find frequently a single line of three cells, between the sector and the margin (and a single line of three cells does not of course constitute three *rows*), while in 18 wings of 9 ♂ and 2 ♀ are *three rows*. This means that in the 85 individuals, 10½ per cent. of the hing wings have three rows; or, to separate the sexes, 14.8 per cent. of the hind wings of the males and 3 per cent. of the hind wings of the females have three rows. These three rows extend for a distance of only two cells in 9 wings of males, and for a distance of from 3 to 6 cells in the remaining 9 wings, male and female.

It is further of interest to note that the individuals having three rows are thus distributed: Florida 1 ♂, Texas (probably near the Nueces River) 4 ♂, Nuevo Laredo (Tamaulipas) 3 ♂, 2 ♀, Teleman (Vera Paz, Guatemala) 1 ♂.

Undoubtedly the existence of this amount of variation in this character in *titia* impairs the value of the classification which I have employed. I have, however, implied its not infallible nature (*l. c.*, p. 20, lines 14–17), have cited some exceptions (*l. c.*, p. 22, foot-note), and am still unaware that a better character exists.—PHILIP P. CALVERT.

DEPARTMENT OF ECONOMIC ENTOMOLOGY

Edited by Prof. JOHN B. SMITH, Sc. D., New Brunswick, N. J.

Papers for this department are solicited. They should be sent to the editor, Prof. John B. Smith, Sc.D., New Brunswick, N. J.

NUMBER OF BROODS OF THE CODLING MOTH AS INDICATED BY PUBLISHED DATA.

By C. P. GILLETTE, Fort Collins, Col.

It seems as if the economic entomologists of the apple-growing sections of the United States should have determined, before this, the number of annual broods of the codling moth in their respective districts. Opinions as to the number are common enough, but these seem largely to be without definite data to rest upon. Some of the conclusions drawn from published records are plainly in error as I shall show.

The writer read a paper before the Association of Economic Entomologists in Denver last summer in which it was shown that the codling moth is quite definitely two-brooded in Colorado, both at the northern limit of successful apple-growing in Larimer County, and in the warm valleys of the south-west where the tender stone fruits are grown to perfection. Letters from Mr. Munson of the Maine Experiment Station and from Dr. Smith, of N. J. Experiment Station, were also quoted, stating that there were, at least, partial second boods in both those States the past summer, and the suggestion was made that perhaps we shall find, after all, that the codling moth is definitely two-brooded throughout its range. Dr. Smith expressed his opinion, however, that it was only a partial second brood that was appearing at New Brunswick. If the moth passes annually through one, or two, or one and a partial second broods in a locality, the fact could be easily determined. To determine with certainty, a partial third brood would not be easy, and it would require a large amount of very careful breeding-cage work to determine a partial fourth brood with any certainty at all.

In spite of the opinion of many entomological friends that there are

more than two broods of the codling moth in many parts of United States, I must say that I am unable to find any records published that tend strongly to prove such an opinion, to say nothing about an indication of even a partial fourth brood.

In Bulletin 25 of the Oregon Experiment Station, 1893, p. 5, Mr. Washburn gives a table and records which he considers to be "convincing proofs that the moth is at least four-brooded in Oregon."

In Mr. Washburn's table he places the beginning of egg-hatching for the first brood of moths June 21st, of the second brood Aug. 29th, and of the third Nov. 6th. The fourth he does not give, but figured like the others, it would come Jan. 15th, and the larvæ would not mature before the first week in Feb. As these dates were to mark the beginnings of the brood the last of each brood would come much later. This, of course, is quite absurd, but I think Mr. Washburn counted the fall bood in the fall and again in the spring and so increased the number of generations that appear during a year by one. This being true, it would cut his number to three broods as he estimated them. But with three broods the hatching of the first eggs for the third brood would come on Nov. 6th. Egg-laying would probably continue for fully six weeks which would carry it to December 18th. To this we should have to add fully three weeks for the development of the larvæ, which would take us to Jan. 8th, which surely is very much too late. If so, this would reduce the number of broods to two, unless there existed a partial brood, which I think it is best to doubt for almost any insect with an abundant food-supply until its presence is thoroughly proven.

Mr. A. B. Cordley, of the Oregon Experiment Station, has recently written me that during four years' work with the codling moth in that State he has never been able to rear a moth later than Sept. 15th. This corresponds almost exactly with our records for northern Colorado, and it means that the larvæ of the codling moth began to hibernate in Oregon as early as the first week in August, and almost certainly cuts the number of broods to two, as they occur in Colorado.

In Bulletin 21 of the Idaho Experiment Station, 1900, p. 101, Mr. Aldrich announces three broods and a partial fourth for that State in the vicinity of Boise, but gives no data to support such a conclusion. If records proving this number of broods are in existence, they should be published in full for the benefit of entomological workers and fruit growers.

Another published record given to prove three broods in Idaho appears in Bulletin 30, New Series, U. S. Dep. of Agr., Division of Entomology, p. 56. The record is by Mr. C. B. Simpson, agent of the division. An orchard of 140 trees was banded and the bands removed at intervals of a few days and the larvæ taken. A complete record of the captures was taken and is given to show the rise and fall in numbers corresponding to the rise and fall of the different broods. If we take the number given for each date in Mr. Simpson's record and divide it by the

number of days the bands were on since being last removed, we shall have a proper set of figures to show the rise and fall of the broods and the results will be as follows: In 1897 the first brood gradually increased in numbers until a maximum of 181 larvæ per day was attained in the period closing July 16th; then there was a rapid falling off to a minimum of 41 per day in the period closing August 9th. A gradual increase than began which gave a second maximum of 191 per day in the period closing Sept. 2d, and then a decline, at first slow and then rapid, to a minimum of 52 per day in the period closing Oct. 19th. As the last period was a long one—15 days—it is probable that the larvæ had almost ceased to come to the bands on the date of their removal.

Figures could hardly have been made to order that would better serve to indicate just two broods of this insect. The maximum of the first brood July 16th, and of the second brood Sept. 2d, compare remarkably well with our records for northern Colorado, and gives 48 days as the average time for the complete round of development. In my paper above referred to I gave 49 days, or seven weeks, as the average time in Colorado.

The records given by Mr. Simpson for 1898 are similar, except that the broods are both later, probably on account of a later spring, and the time elapsing between the two maxima is a little greater.

Both records are strong proofs of just two broods and yet the writer says "From these records, supplemented by observation, I can say definitely that there are three broods in the vicinity of Boise and the greater part of the Snake River Valley." I can only account for such a statement on the supposition that Mr. Simpson had a pre-formed opinion that he must make out, at least, three broods, and he did not have the courage to announce less. Pre-formed opinions are dangerous things when carrying on an experiment.

The data given by Mr. Cockerell in Bulletin 25, pp. 48-50, of the N. M. Experiment Station, 1898, indicate that there may be more than two broods of the codling moth in that State, but the evidence is not at all conclusive, particularly when we notice that on Sep. 3rd there were 53 larvæ taken, from which only three moths hatched. At Fort Collins we have hatched late moths of the second brood as late as Sept. 16th.

Is it not possible, yes probable, that many errors have been made and are being made by entomologists who announce an insect as varying in its number of generations in a locality or in different localities? It is certain that such announcements are repeatedly made in entomological literature without accompanying data to support them. Too often the the time required for the life cycle is estimated in days, and then the duration of the insect's occurrence in the year is estimated in days, and the latter number divided by the former to determine the number of broods. Such an estimate I believe will usually be erroneous if the number of broods is more than one or two. The codling moth requires, on an average, about seven weeks to pass through its transformations. This

would enable us to figure fully three and a half broods for Fort Collins, where we know there are but two broods.

In working to determine broods there are two factors that should be kept in mind. In the first place, the individuals of a brood do not all appear at one time but are usually distributed over many days, often several weeks. We have had the first brood of the codling moth appearing in our cages for over two months. And then the early individuals of the last brood of an insect begin to hibernate or otherwise prepare to go over winter long before the late individuals of the brood. Citing the codling moth again as an instance, the larvæ of the early part of the second brood begin to spin up to pass the winter as larvæ early in August at Fort Collins but the late members of the brood are in apples till winter.

Doings of Societies.

A regular meeting of the Chicago Entomological Society was held in the John Crerar Library April 17th. Seven members were present. President Longley in the chair. Mr. Healy gave an interesting talk on edible insects. Among other things he spoke of the Digger Indians eating grasshoppers. He also said he had heard his father tell of the troops in the Mexican war eating ants on their hardtack when food was scarce. Prof. Westcott told of an experiment which C. V. Riley had made on baked grasshoppers. It was suggested that the Society indulge in grasshopper cakes in the coming season. Mr. Longley spoke of a Mexican delicacy—the bottle ant. Many other instances of insects being eaten were discussed.

A meeting of the American Entomological Society was held April 24th. Dr. Calvert, President, in the chair. Fourteen persons were present. Dr. Skinner exhibited a new variety of *Papilio polyxenes* Fab. Mr. Laurent said he had had a specimen of *Thyreus abbotti* emerge to-day. The pupa was kept outside all winter. He attributed the early emergence to the warm spell. Mr. Wenzel said he and Prof. Smith had recently visited Anglesea, N. J., and had examined the ponds and found multitudes of mosquito larvæ. Mr. Wenzel predicted a large crop of the imagos this summer. Mr. Wenzel also reported the capture of both sexes of *Batrisus ione* at Angle-

sea, on April 20th. Mr. Huntington exhibited some Diptera which had been sent in butterfly papers and had arrived in good condition. Dr. Calvert advocated a separate cyanide jar for collecting Odonata. Otherwise the dragonflies were covered with scales of other insects which had to be removed. Mr. Daecke reported the capture of *Tetragoneura spinosa* ♀ April 21st, at Laurel Springs, N. J. Also took a pair *Xylophagus persequus* in coitu. Some Pentatomids were found feeding on a larva of *Haploa lecontei* and eight living larvæ of this moth were taken. Mr. J. Chester Bradley was elected a member.

HENRY SKINNER, *Secretary.*

The twenty-fourth regular meeting of the Harris Club was held at 35 Court Street, Boston, on the evening of February 11, 1902, President Bolster in the chair. Fourteen persons were present. Dr. L. O. Howard was unanimously elected to honorary membership. Extensive exhibits of butterflies of the genus *Colias* were made by various members, and Mr. Field gave a talk upon the traits of *C. philodice*. Mr. Burrison gave an account of a recent visit to Mr. Thomas Bean, at Laggan. A communication from Mr. George B. King, dealing with myrmecophilous insects, was read.

W. L. W. FIELD, *Secretary.*

The twenty-fifth regular meeting of the Harris Club was held at 35 Court Street, Boston, March 11, 1902. Vice President Low presided. Sixteen members were present. Mr. Newcomb gave a few notes on April captures of Lepidoptera during the past three years. Mr. Kirkland spoke of the interesting captures to be made of early predaceous insects in the webs of the tent-caterpllar, *C. americana*. Exhibits of early spring Lepidoptera were made by Messrs. Newcomb, Rogers and Hall. Mr. Kirkland presented each of the members attending with a copy of his pamphlet, "The Shade Tree Insect Problem," containing accounts of the elm leaf beetle, gypsy moth, brown tail moth, etc., and methods of fighting them.

A. P. HALL, *Secretary pro tem.*

At the April meeting of the Feldman Collecting Social held at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, ten persons were present.

Prof. Smith exhibited portions of branches of elm showing the work of *Anthaxia ridifrons*. Associated with it were the burrows of a large unidentified Buprestid, and of *Neoclytus erythrocephalus;* the borings of the latter are round and quite deep as compared with the others. The borings of a probable Scolytid were also present.

Mr. Daecke reported the capture of *Vespa Carolina* at Lucastown, N. J., on April 14th, and asked concerning its building habits. Discussed by Messrs. Fox, Johnson and Smith.

Mr. H. Wenzel reported the capture of *Adranes LeContei* near Woodbury, N. J., April 13th, and of an interesting Staphylinid from a colony of termites.

Prof. Smith exhibited pieces of an old railway tie from Anglesea, N. J., by Mr. E. L. Dickeson with masses of eggs of some large orthopterous insect. They were unknown to the members, but Mr. Johnson and Mr. Seiss reported the finding of similar pods.

Mr. H. Wenzel exhibited immaculate forms of *Cicindela punctulata*, *splendida*, *cumatilis*, and *sexguttata* from Vowell's Mills, La.

Mr. Fox spoke on a new genus of bees, *Lithurgopsis* to replace *Lithurgus* as a name for the American species which had been referred to that genus.

Mr. Johnson exhibited specimens of *Phylloscelis pallescens* and *atra* and a mottled form, and spoke of the difference of opinion as to whether this latter form represented a distinct species or was the same as *atra*. He also showed living larvæ of *Stegomyia fasciata* from Cuba, which he had raised from eggs carried to him in a dry state by Mr. John Taylor, of Havana.

Prof. Smith stated that the eggs of *Ædes Smithii* are laid in dry pitcher-plants, and hatch only when these are filled with water. *Culex canadensis* and *triseriata* hibernate apparently in larval stage. Although *Anopheles maculipennis* and *Culex pungens* were found in early April of this year in cellars at

Anglesea, N. J., no specimens of *Culex sollicitans* had been encountered. On April 11th larvæ of *Culex cantans* had been found but no *sollicitans*.

WILLIAM J. FOX, *Secretary*.

The third regular quarterly meeting of the California Entomological Club was held on the evening of February 22, 1902, at the residence of Mr. Beverly Letcher, 2701 Laguna Street, San Francisco. President Fuchs in the chair.

A paper by Dr. Edw. C. Van Dyke on "The Faunal Areas in California as seen by a Field Coleopterist" was then read.

The Doctor divided the State Faunal Areas into two divisions—the Boreal and the Sonoran, as indicative of their mode of origin. The Boreal was subdivided into the Maritime and the Sierran; the Sonoran into Southern California, Great Basin and the Sonoran proper.

He named the following species of Coleoptera as most typical of the several faunas: Of the Maritime, among the Carabidæ, *Pemphus angusticollis* with its races; *Brennus cristatus* and its more southern relative *reticulatus*, *Elaphrus pallipes*, *Loricera 10-punctata*, *Leistus ferruginosus*, *Promecognathus lævissimus*, *Bembidium erasum*, *B. 4-foveolatum*, *B. spectabile*, *Pterostichus crenicollis*, *Pt. amethystinus*, *Pt. longicollis*, and *Pt. vicinus;* several species of *Amara*, *Platynus*, *Tachycellus nigrinus; Haliplidæ*, *Brychius hornii;* Dytiscidæ, *Dytiscus marginalis;* several Silphides; Byrrhidæ, *Simplocaria nitida*, two species of *Pedilophorus;* Lucanidæ, *Ceruchus striatus;* Scarabæidæ, *Aphodius ursinus;* Cerambycidæ, *Opsimus 4-lineatus*, *Leptalia macilenta*, etc.; more southern species which, at one time, belonged to this fauna; *Bembidium laticeps*, *Trechus barbaræ*, *Pterostichus menetriesii*, *Pt. isabellæ and Pt. congestus*.

Of the Sierran, the genus *Omus*, *Cicindela perviridis*, *C. graminea*, most *Brennus*, *Pterostichus ater*, species of *Bembidium*, *Platynus*, *Harpalus*, *Nebria*, *Notiophilus*, *Trechus chalybeus*, *Patrobus septentrionis*, *Pleocoma*, *Hoplia*, *Dichelonycha*, coniferous wood-boring beetles in part, as also many of the Dytiscidæ, Mycetophagidæ, Endomychidæ and Coccinellidæ.

Of the Sonoran, *Edrotes ventricosus*, *Triorophus lævis*, *Cryp-*

toglossa verrucosa, many *Asida* and other Tenebrionidæ; *Polycesta velasco*, *Acmæodera gibbula*, *Tragidion annulatum*, *Hololepta yucateca*, and several genera of the Cantharidæ, etc.

Of the Great Basin (small districts in Mono, Inyo, Modoc and Lassen Counties in the south and north), *Cicindela cinctipennis*, *C. pseudosenilis*, *Eleodes nigrina*, several *Acmæodera*, etc.

Of the Southern Californian (northern and southern types somewhat mixed), southern forms like *Asida*, *Phlœodes*, *Zopherus*, *Eleodes*, *Pseudomorpha behrensii*, *Polycesta californica*, many *Acmæodera* and Cantharidæ.

He further stated "these various faunas and subfaunas are of course quite distinctive within certain limits, but along their margins they intermix, constituting the so-called transitional zones. Attention was called to the theory of a succession of migrations of southern types to account for southern species being domiciled within the region of more northern forms, such as the *Coniontini*, *Blapstinus* and several *Eleodes*.

Mr. Beverly Letcher in a paper on the "Distribution of Californian Day Fliers," said:—Consideration has been given to the distribution of Lepidoptera only, without reference to other orders, and the subject approached as though nothing existed in California but the butterfly.

One hundred and fifty-eight day fliers out of 225 species credited to the State are considered. Distribution closely follows the coast and Sierra Nevada Mountain ranges; the intervening valleys have no distinctive fauna; there is, in addition, the Southern California, including Santa Barbara, Ventura, Riverside, Los Angeles and San Diego Counties west of the mountains, and the desert in the southeastern part of the State, and the so-called Alaska Maritime and Great Basin faunas, which are not considered for lack for data.

Information with regard to desert fauna rests on one list published in the ENT. NEWS. Of 23 species reported, 18 are peculiar to the desert. Distribution of others as follows:

Peculiar to northern coast	. . .	22 species.
" " southern "	. . .	17 "
" " Sierra Nevada	. . .	27 "

Northern coast and Sierra Nevada have in common	23	"
Northern coast and southern coast have in common	17	"
Southern coast and Sierra Nevada have in common	4	"
All divisions, except desert, share . .	27	"

A number of species common to northern coast and Sierra Nevadas are found in the neighborhood of Mt. Shasta, where the two mountain ranges merge, and from which point the species range southerly, sometimes in the Sierras, sometimes in the coast, sometimes in both.

In order to compare and correlate plant and insect distribution as far as possible, an invitation was extended to Miss Alice Eastwood, Curator of the Herbarium of the California Academy Natural Sciences, to present her views upon the Floral Areas of California. Miss Eastwood responded, and among the many instructive things she said the following were to the point :—"At first sight it would seem that it would not be possible to draw a line between Central and Northern California, as there is no mountain chain here to make a natural barrier. However, San Francisco Bay and the great rivers that empty their waters therein can approximately be used.

"The flora also suggests this division. In the coast mountains, Mt. Talmalpais may be taken as the southern landmark of the northern flora and Mt. Diablo the most northern of the southern.

"On the former mountain *Quercus garryana*, *Rhododendron californicum* and *Ceanothus velutinus* find their southern limit. These are all species most abundant and characteristic in the north. On the latter mountain *Pinus torreyana* and *Arctostaphylos glauca* find their most northern home, and these species are characteristic of the flora of the southern coast mountains.

"In the Sierra Nevada the line reaches the Yosemite or some point north of it, perhaps the Calaveras grove of *Sequoia*. It is in this region that *Arbutus menziesii* ceases to grow, and that the Douglas spruce finds its southern home."

After discussion by Messrs. Letcher, Fuchs, Huguenin, Ehrhorn, Cottle and Blaisdell, it was decided by vote that a line of convenience should be drawn across the State as suggested by Mr. Ralph Hopping, as follows:—Beginning at the Golden Gate, following the Bay of San Francisco to the mouth of the San Joaquin River, thence along the northern boundaries of San Joaquin, Calaveras and Alpine Counties to the Nevada State line. By this act the boundary lines of Northern, Central and Southern California (Fall's line) are definitely fixed.

Notes on *Acmæodera mariposa* by Ralph Hopping were then read. He stated that "this rare species distributed in collections as follows:

1 specimen, Mokelumne Hill, Calaveras Co., Blaisdell coll.
1 " San Mateo Co., Van Dyke coll.
1 " Tuolumne Co., Fuchs coll.
1 " Horn coll.
1 " Kaweah, Tulare Co., Daggett coll.
3 " Tulare Co., Hopping coll.

Mr. Fall seems to think that *Ac. dohrnii* may possibly not be distinct from *mariposa*. At present we have the latter from Calaveras to Tulare County, while the former extends from Mariposa County to Los Angeles."

Notes on Lepidoptera and two specimens of *Cychrus* were received from the Grattum Naturalists' Club, El Dorado County.

An anonymous and humorous communication was received from the U. S. Agric. Dept.

A vote of thanks was extended to Miss Eastwood for her interesting talk.

Mr. Edw. Ehrhorn exhibited an interesting collection of scale insects, explaining their beneficial and injurious properties, also their distribution by a map, stating that they follow their food plants, and that in 1875 there were only 570 species known, while at the present time over 1500 species are described.

Six members and two visitors were present. One new member elected. Adjournment.

F. E. BLAISDELL, *Secretary*.

EXCHANGES.

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Lepidoptera for exchange from United States, Europe, South America and East India for specimens new to my collection.—A. Troschel, 446 Larchmont Ave, Chicago.

Lepidoptera.—Exchange desired with collectors in any State. Please send lists.—John & Hurd Comstock, 1572 Ridge Ave., Evanston, Ill.

Wanted.—Hymenoptera, especially ants and wasps from the Southern and Western States and American Termites, and any entomological publications.—Canisius College Museum (H. Wolff, S. J.), Buffalo, N. Y.

Exchange.—*Cicindela puritana* for any Cicindelidæ new to my collection. Will exchange also N. American or European Coleoptera. Send for lists. Correspondence in English and French.—C. Crozet, New Park Ave., Hartford, Conn.

Diptera.—Wanted, as many Asilina as possible from all parts of North America.—Write for particulars to Prof. C. H. Fernald, Amherst, Mass.

Lepidoptera—*Argynnis nitocris* var. *nigrocærulea* Ckll., for exchange. Also many other rare butterflies.—Henry Skinner, Acad. Nat. Sciences, 1900 Race Street, Philadelphia.

Exchange.—British Columbia Lepidoptera. Only North American species wanted. Send lists.—Ernest M. Anderson, 64 Superior Street, Victoria, B. C.

Lepidoptera—I wish to purchase Lepidoptera of North America, especially *Noctuidæ*.—Edouard Brabant, Morenchies Par. Cambria (Nord), France.

Exchange.—Will collect Scydmænidæ and Pselaphidæ in exchange for papers on the families of Scydmænidæ, Pselaphidæ and Staphylinidæ —August Schmidt, 1836 E. Atlantic St., Philadelphia.

Lepidoptera.—I would like to correspond and exchange with some new beginners.—Charles L. Heink, 4320 North Eleventh St., St. Louis, Mo.

Wanted.—Living larvæ, pupæ, fertile females or eggs of any of the North American *Callimorphæ* (genus *Haploa* Hüb.). Will exchange New Hampshire Lepidoptera.—F. H Foster, Claremont, N. H.

Dytiscidæ from Florida and other Southern States, from Illinois and Ohio, and from the Northwest, Alaska, British Columbia and Hudson Bay wanted in exchange for cash.—Address John D. Sherman, Jr., 148 East Eighteenth Street, New York City.

Wanted at once.—For cash. One hundred cocoons: *cecropia, polyphemus* or *promethea*. L. O. Howard, Division of Entomology, U. S. Dept. of Agriculture. Write before sending.

In Exchange for specimens of equal value, especially *Catocalas*. I offer *C. Blandula, Micronympha, Alabamæ, Olivia*, etc.—Joseph Mattes, 138 East 48 Street, New York City.

Chrysomelidæ Wanted.—Especially *Cryptocephalini*. Undetermined material accepted. Will give good exchange. Frederick Knab, 8 Springfield Street, Chicopee, Mass.

Lepidoptera.—Wanted by purchase or exchange.—B A. Overbeck, 30 Hill St., Allegheny, Penna.

Wanted.—Cocoons of Cynthia and Luna moths in exchange for cocoons of Promethus and Cecropia.—Harry Russell, 905 Clinton Ave., Bridgeport, Conn.

Arctians.—Living eggs or larvæ of any North American moths of the genus *Arctia* wanted for the purposes of studying preparatory stages. Will be glad to render help, if possible, as to wants of anyone assisting.—Arthur Gibson, Cent. Exp. Farm, Ottawa, Can.

Basswood Insects.—The writer is making a special study of insects injurious to Basswood (*Tilia*). Notes on insects found feeding on this tree will be acceptable.—Arthur Gibson, Cent. Exp. Farm, Ottawa, Can.

Lepidoptera.—Wanted for cash: cocoons of *A. pernyi* and eggs of *A. yama-mai* and *A. pernyi*.—R. Ludwig, 513 Empire Bldg., Atlanta, Ga.

Will collect any order in Pennsylvania and New Jersey this season in exchange for Hymenoptera.—J. Chester Bradley, 2221 Spring Garden St., Philadelphia.

Wanted.—Specimens of the genus Homoptera (except *edusa* and *lunata*), from all parts of the United States and Canada, for comparison. Will give other North American Lepidoptera in exchange.—W. E. Longley, 115 South 64th Ave., Oak Park, Ill.

Lepidoptera.—I would like to correspond and exchange with some new beginners.—Phineas Whiting, 106 Fairmount Street, Lowell, Mass.

Will exchange for Holland's Butterfly book, other literature treating of Lepidoptera, or for desirable specimens of that order, an absolutely new copy of "Howards Insects." See adv. for list of Utah material which I have for exchange.—L. I. Holdredge, Hudson High School, Hudson, N. Y.

Will collect in any order in exchange for Coleoptera, Hemiptera and Lepidoptera.—Charles Stevenson, 906 St. Urbain Street, Montreal, Quebec, Canada.

Exchange Wanted.—Particularly *Catocalas*. Send list to Jos. H. Reading, 775 North Rockwell Street, Chicago.

Plusias Wanted.—Having just described a dozen new species of *Plusias*, all represented by females, I will pay liberally for males of any of the same, or for any *Plusias* of which I have short series. Correspondence solicited.—R. Ottolengui, 80 W. 40th St., N. Y. City.

Wanted.—"Classification of the Coleoptera of North America," by LeConte and Horn; will give cash or exchange for Volume in good condition.—M. E. Hoag, D.D.S., Maxwell, Iowa.

Coleoptera.—Twenty-five California species of Cleridæ, Buprestidæ and Malachidæ, in sets of four, for species in the same families not in my collection.—Ralph Hopping, Redstone Park, Kaweah, Tulare Co., California.

Lepidoptera.—N. A. Lepidoptera desired. Those willing to collect, in exchange for European specimens, please communicate with James McDunnough, Kleist Str. 42, Berlin, Germany.

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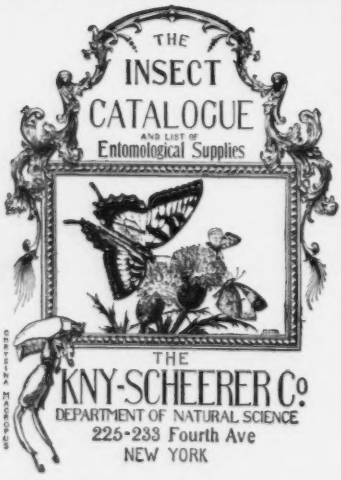

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